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Letter to the Editor

Patterson-Stevenson-Fontaine Syndrome: 30-Year Follow-Up and Clinical Details of a Further Affected Case

To the Editor:

The nosology of the acrofacial dysostoses was reviewed extensively by Opitz et al. [1993]. The Patterson-Stevenson-Fontaine syndrome (MIM 183700) is a rare variant, characterized by variable oligosyndactyly of the feet, unusual ears, deafness, cleft palate and autosomal dominant inheritance. The original description by Patterson and Stevenson [1964] concerned an affected father and son; a second family with four affected individuals (some of whom also had learning difficulties) in three generations was described by Fontaine et al. [1974]. Opitz et al. [1993] stated "A follow-up of these patients is strongly urged. . . ." Recently we reviewed the son originally described by Patterson and Stevenson [1964], who is now an adult (case JL). One of his three sons (case AL) has inherited the same condition.

The clinical findings in case JL are illustrated in Figure 1A–C. His height (177 cm), head circumference (58.9 cm), and intelligence are normal. Although his craniofacial appearance was described as normal in the report of Patterson and Stevenson [1964], he required considerable orthodontic treatment as a child and now has moderate malar hypoplasia and microretrognathia. His ears are large (7.0 cm bilaterally; +3 SD) with a small pit on the external surface of each lobe, but otherwise are morphologically normal; on examination his middle ears were normal. Audiometry showed a mild high tone deafness, consistent with occupational exposure to noise. His hands are normal clinically; his feet are shown in Figure 1C (the radiological appearance of his left foot was previously illustrated by Patterson and Stevenson [1964]). Chromosomes, studied recently, were normal (46,XY).

His son, case AL, was born at 39 weeks of gestation after a normal pregnancy. Birth weight was 3,680 g. Abnormality of both external ears was noted immediately. He was otherwise well and examination of the palate and middle ears was normal, but auditory evoked potentials at the age of two months showed a 70 dB sensorineural hearing loss bilaterally and he has been fitted with hearing aids. His motor development was slow compared to that of his two older siblings: he

Fig. 1. Facial appearance **(A, B)** and feet **(C)** of JL, age 34 years.

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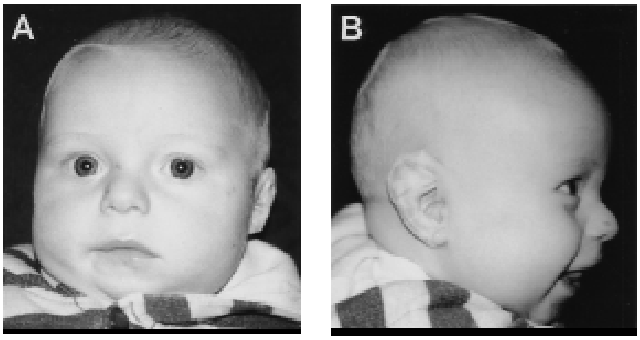

Fig. 2. Frontal (**A**) and lateral (**B**) views of AL, age 4.5 months. The ears have been taped to improve their position.

did not attain head control until four months, he sat at nine months. His facial appearance is shown in Figure 2A, B: frontal appearance is normal, but microretrognathia is evident on lateral view. The structure of his ears (Fig. 3A,B) is unusual: the lower lobe is partially detached on the right and completely detached on the left. His hands and feet were normal clinically, and his feet were also normal radiologically. His two older brothers had a normal facial appearance, limbs, and hearing.

Our new observations document transmission of the phenotype originally described by Patterson and Stevenson [1964] to the third generation. Although AL does not have ectrodactyly, his craniofacial appearance and audiological abnormalities indicate that he has inherited the condition. The molecular basis of this disorder is unknown but our findings highlight the variable penetrance and expressivity of the craniofacial and limb abnormalities within a single family. A.C. Stevenson, one of the authors of the original report, recognized that non-syndromic ectrodactyly was also characterized by variability in expression as well as segregation distortion [Stevenson and Jennings, 1960]. These findings have been confirmed and extended [Jarvik et al., 1994], and a mouse model, dactylaplasia (*Dac*) provides a paradigm for the study of two-locus interaction in congenital malformation [Johnson et al., 1995]. Loci for non-syndromic ectrodactyly on human chromosome arms 7q [Crackower et al., 1996] or 10q [Nunes et al., 1995] might be implicated in the Patterson-Stevenson-Fontaine syndrome, possibly as a contiguous gene disorder.

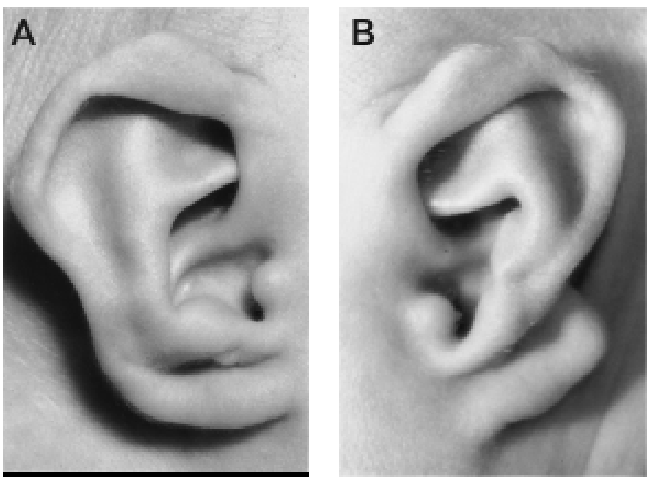

Fig. 3. Right (A) and left (B) ears of AL.

REFERENCES

Crackower MA, Scherer SW, Rommens JM, Hui C-C, Poorkaj P, Soder S, Cobben JM, Hudgins L, Evans JP, Tsui L-C (1996): Characterization of the split hand/split foot malformation locus *SHFM1* at 7q21.3–q22.1 and analysis of a candidate gene for its expression during limb development. Hum Mol Genet 5:571–579.

Fontaine G, Farriaux JP, Delattre P, Gidlecki Z, Poupard B, Durieux G, Piquet JJ (1974): Une observation familiale du syndrome ectrodactylie et dysostose mandibulo-faciale. J Génét Hum 22:289–307.

Jarvik GP, Patton MA, Homfray T, Evans JP (1994): Non-Mendelian transmission in a human developmental disorder: split hand/split foot. Am J Hum Genet 55:710–713.

Johnson KR, Lane PW, Ward-Bailey P, Davisson MT (1995): Mapping the mouse dactylaplasia mutation, *Dac,* and a second gene that controls its expression, *mdac.* Genomics 29:457–464.

Nunes ME, Schutt G, Kapur RP, Luthardt F, Kukolich M, Byers P, Evans JP: (1995): A second autosomal split hand/split foot locus maps to chromosome 10q24–q25. Hum Mol Genet 4:2165–2170.

Opitz JM, Mollica F, Sorge G, Milana G, Cimino G, Caltabiano M (1993): Acrofacial dysostoses: review and report of a previously undescribed condition: the autosomal or X-linked dominant Catania form of acrofacial dysostosis. Am J Med Genet 47:660–678.

Patterson TJS, Stevenson AC (1964): Cranio-facial dysostosis and malformations of feet. J Med Genet 1:112–114.

Stevenson AC, Jennings LM (1960): Ectrodactyly—evidence in favour of a disturbed segregation in the offspring of affected males. Ann Hum Genet 24:89–96.

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